



Low-carbon and resource efficient industry

Background

Industry plays a central role in global efforts to mitigate climate change. In developing, non-OECD countries, the industrial sector contributes nearly half (47 per cent) of the carbon dioxide emissions through fuel consumption and electricity use. Globally, industry accounts for 37 per cent of global energy use and 25 per cent of global emissions of greenhouse gases. It is crucial that developing and transition countries ensure that their industrial growth is both decoupled from aggravating climate change and robust in terms of its likely impacts. Climate change mitigation and adaptation necessitates the development and wide-scale application of low-carbon and resource efficient and cleaner production (RECP) technologies, practices, management systems and business models that:

- Reduce the material and energy intensity of products
- Minimize the consumption of energy, in particular from high-carbon fossil energy sources
- Minimize emissions of non-energy related greenhouse gases
- Maximize growth with low resource consumption and low pollution

- Reduce dependence on water, fossil fuels and other natural resources that are likely to become scarcer as a result of climate change

Approach

The term low-carbon industry is primarily used to refer to energy-related solutions, such as energy efficiency, renewable energy or carbon sequestration and storage. However, for industry, low-carbon production is best understood as the continuous reduction of the net emissions of greenhouse gases per unit of product or service delivered. Low-carbon industrial approaches form the basis for addressing mitigation and adaptation to the likely impacts of climate change, including economic, social, environmental and political changes, thereby enabling climate resilience. Low-carbon production builds upon and extends from resource efficient and cleaner production practices and technologies, emphasizing a life cycle perspective. It focuses on the synergistic possibilities for gains in the productive use of energy, materials, chemicals and water in efficient and effective products and production systems.

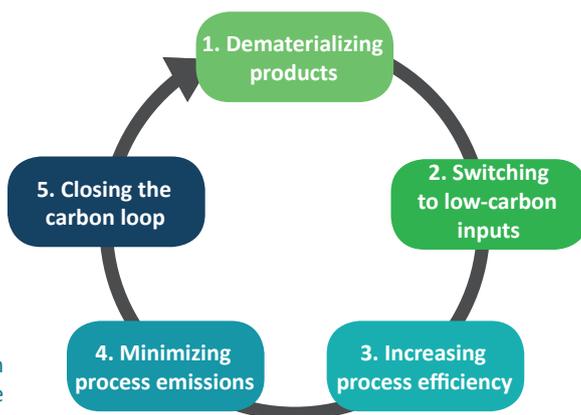
As the figure illustrates, there are five fundamental dimensions of the contribution of RECP to low-carbon industry:



1. Reducing the total material, energy and water intensity of products and services, minimizing life cycle greenhouse gas emissions and resource requirements

5. Recovering organic wastes for reuse as feedstock for energy and material, thereby preventing them from being released into the atmosphere as methane or carbon dioxide and maximizing the value creation from crops and other biomass resources

4. Adapting and adopting clean technologies and practices that reduce and, where possible, eliminate the generation of greenhouse gases from non-energy related uses, including for example emissions of nitrous oxide and methane from the chemical and food industries



2. Using low-carbon alternatives as substitutes for carbon-intensive fuels and materials, including renewable energy and materials, but also enhancing recovery from secondary sources, such as waste heat and municipal and other suitable wastes in industrial processes

3. Making industrial processes more efficient in regard to their use of energy, water and materials, mitigating greenhouse gas emissions from fuel use and power consumption and reducing the dependency on water and other feed stocks to adapt to the impacts of climate change

Projects

- Industrial waste minimization and low-carbon production for the rice and coffee sub-sectors, in Cambodia (rice sector only), Colombia, Peru and Viet Nam, 2012-2016, Resource efficient and cleaner production project funded by the Government of Switzerland
- Industrial waste minimization and low-carbon production for the Cassava industry in China, 2012-2016, RECP project funded by the Government of Switzerland
- Low-carbon industrial development in Africa: Egypt (food processing), Kenya (tea), Senegal (food processing) and South Africa (food processing), 2013-2016, funded by the Government of Japan
- Low-carbon production in agro-industry in Macedonia and Uganda, 2010-2013, funded by the Government of Austria
- Low-Carbon project in the greater Balkan region in agri-food sector (Croatia, Macedonia, Montenegro, Moldova and Serbia), 2013, funded by the European Union

Overview of results

Resource Efficient and Cleaner Production Programme — Industrial waste minimization and low-carbon production		
Activities	Environmental benefits	Economic results
In Cambodia (rice sector only), Colombia, Peru and Viet Nam, 2012-2016		
28 Resource Efficient and cleaner production assessments and 50 RECP measures identified 20 companies implemented low-investment RECP measures	275 tons of CO2 avoided per year 980 tons of waste recycled per year 900,000 kWh of electricity saved per year	Investment: USD 8,600 Savings: USD 63,588 per year (mostly in Viet Nam)
9 ongoing investment projects on RECP technology transfer for rice husk and coffee pulp valorization	150,000 tons of CO2 avoided per year 120,000 tons of waste recycled Product quality improved (5-10% less broken rice due to improved drying)	Investments: USD 4,050,000
4 potential investment projects on RECP technology transfer for rice husk and coffee pulp valorization	128,150 tons of CO2 avoided per year 268,300 tons of waste recycled per year	Investments: USD 5,200,000
In Moldova, Macedonia, Croatia, Montenegro and Serbia, 2013		
13 low-carbon assessments in 5 countries	Reduction in: Energy: 130,733.32 MWh per year Coal: 140 tons per year Natural gas: 1,920,000 Nm3 per year Oil: 600 tons per year Biomass: 198 tons year Organic waste: 69,295 tons per year Water: 4,000,000 m3 per year CO2 emissions by 9,000 tons per year	In total, 93 RECP options were identified. Investments: EUR 9.8 million, with a payback period of 4 years